A directional notion of multivariate extreme value analysis

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Abstract. *Extreme value theory has been commonly applied in fields such as insurance, finance, economy and environmental science. It focuses on the quantification of the multivariate risks outside of the observable sampling zone; that is the analysis of multivariate quantiles to determine extreme regions located at high levels. However, the lack of a total order in the multivariate framework implies quantile concepts with a directional notion involved, as we appreciate in the growing literature on this matter. Therefore, this work provides an out-sample estimation method for the recently introduced Directional Multivariate Quantiles. The asymptotic normality of the proposed estimator is derived. And finally, the methodology is illustrated with an example for which the theoretical directional multivariate quantiles are known.*

Keywords. *Directional multivariate quantiles; Regular variation; Tail function*

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